

## MR. FARWELL'S REPORT

ON THE PROPOSED

## SHUSWAP AND OKANAGAN RAILWAY.

VICTORIA, B. C., June 9th, 1887.

To the Honourable Attorney-General:

SIR.—In accordance with your instructions dated the 15th April, 1887, I have visited the localities to be affected by the proposed Shuswap and Okanagan Railroad, and have the honour to report as follows:—

1st. As to the cost of constructing and equipping the S. & O. Railroad, length 51 miles, estimated by the S. O. R. Co. to cost \$1,370,180.27.

2nd. As to the extent of the lands suitable for agriculture traversed by, and tributary to, the proposed railroad, estimated by Mr. C. E. Perry, C. E., Chief Engineer to the S. & O. R. Co., at 340,000 acres.

3rd. As to the accuracy of the verbal statements made by the promoters of the company to the Government of British Columbia, to the effect that the said lands are well adapted for wheat growing, and capable of producing wheat in sufficient quantities to supply the whole of the lower country, including Vancouver Island.

First, as to the cost of constructing and equipping the S. & O. Railroad, length 51 miles, estimated by the company to cost \$1,370,180.27.

The proposed line commences at Sicamoose Station, on the C. P. R. line, and follows, in a southerly direction, the west shore of Mara Lake to the mouth of Shuswap River, thence it continues along the left bank of Shuswap River to Lambly's Landing. The Shuswap River at this point turns abruptly to the east. The railway line continues in a southerly direction through Spallumcheen Valley, crossing Bennett's Creek near its confluence with Shuswap River, traversing its right bank to the watershed, between Shuswap River and the head of Okanagan Lake. Crossing the divide the line is carried on the left bank of Deep Creek (which flows into the head of Okanagan Lake) to the head of Otter Lake. Thence it rises on a side-hill into the Swan Lake Valley, which it follows to Priest Valley, thence down Priest Valley to the Okanagan Lake.

The first ten miles from Sicamoose to the mouth of the Shuswap River is through heavy rock work, the shore of Mara Lake being very rocky and precipitous. From the head of Mara Lake to the crossing of Bennett Creek, 13 miles, the work is lighter, with cuttings in gravel and clay. Thence to the head of Otter Lake, 13 miles, the work is rather heavy in clay cutting and embankment. Thence the line rises to the Swan Lake Valley in heavy clay cuttings for about four miles, with a grade of 48 feet per mile for 6,600 feet. Thence the work is light for nine miles to the point of descent to the Priest Valley Arm of Okanagan Lake. The last two miles to the lake is in heavy rock work, cemented gravel and clay, on a grade of about 50 feet to a mile. This grade and the one rising out of Deep Creek Valley are the steepest on the whole line.

I have examined Mr. Perry's plans and profiles, and am satisfied the amount of rock excavation cannot be materially reduced.

The excavation in earth may probably be reduced on the construction location of the line.

An estimate for the equipment of such a line of railway is open to a considerable margin.

For instance, one engineer might figure on station buildings, &c., with some claim to architectural beauty, similar to those erected by the Northern Pacific Railway Company, another might feel satisfied with the barn-like structures to be seen on the Canadian Pacific road. After careful consideration I am of opinion that the Shuswap and Okanagan Railway cannot be built and suitably equipped for a less sum than \$25,000 per mile, and rigid economy

will be required to keep the total cost within that amount—51 miles at \$25,000 = \$1,275,000.

2nd. As to the extent of the lands suitable for agriculture traversed by, and tributary to, the proposed railroad, estimated by Mr. Perry, C.E., Chief Engineer to the S. & O. R. Co., at 340,000 acres.

The portion of Yale District in question is situated in the south-east corner of the interior plateau of British Columbia, and is described by Dr. Geo. M. Dawson in his report on the physical and geological features of the southern portion of the interior of British Columbia, published in the Report of Progress, Geological Survey of Canada, 1877-78, from which I have made the following extracts:—

P. 7. B. "The extreme upward limit of agriculture may be stated at 3,000 feet, and it will be observed that the greatest area of comparatively level plateau country lies above this elevation, and is subject to more or less summer frosts. Farming is in consequence practically confined to the trough-like valley bottoms, or slopes adjacent to them, and in most cases to those portions of these on which water may be brought for irrigation. It is beginning to be found, however, that fall wheat may be grown on many of the higher levels on which water cannot be obtained, the moisture left by the winter's snow being sufficient for its development in an average season. The soil is almost everywhere very rich and yields crops excellent both as to quality and quantity. Little demand at present (1877) exists for cereals, however, owing to the isolation of the district, but if stimulated by a good market, a considerable annual export could be made."

P. 57. B. "About the north end of Okanagan Lake is an extensive region characterized by broad open valleys separated by lower ranges of hills, and affording not only stock ranges but much arable land." \* \* \*

P. 60. B. "The Spallumcheen Valley, running from the north end of Okanagan Lake to the Spallumcheen Arm of the Shuswap Lake, is already an agricultural district of some importance, and constitutes the largest area of available land found together in any one valley of the interior of the southern part of the Province. The portion of the valley examined (south end) is partly prairie land, most of which is taken up, and partly wooded. The climate is such that without irrigation fine crops of all sorts can be raised. The soil of the lower benches and bottoms is clayey, deep and rich; that of the higher levels is lighter, but still good. The sub-soil shows a tendency to resemble the white silt deposit, but it is not well characterized as such." \* \* \*

I estimate that Okanagan Lake is about 1,200 feet above the level of the sea. The Shuswap River at Lambly's Landing was found by Mr. L. B. Hamlin, C.E., by instrumental survey for a canal in 1882, to be 20.32-100 feet higher than Okanagan Lake. The low land through Spallumcheen, Swan Lake and Priest Valleys is about 1,300 feet above the sea level. In my estimate of the agricultural land in this vicinity I have included none at a greater elevation than 1,800 feet above sea level, or 600 feet above Okanagan Lake. The maximum elevation it will be observed is 1,200 feet below the summer frosts limit as stated by Dr. Dawson.

Any reference made herein to townships and sections applies to a map "of a portion of Osoyoos District," published by the Lands and Works Department of British Columbia in 1873, drawn from surveys made by Mr. John Jane, C.E. The topography on this map, though generally only sketched in, is remarkably correct, and has enabled me to give what I am satisfied is a close approximation to the actual area of the cultivable land embraced within its limits.

I may be permitted to point out certain conventionalisms, which are current in this neighbourhood. In the Spallumcheen Valley proper, for instance, one is told "all the land is taken up," which means that all the prairie land is occupied. In the more southern portions of the district one is informed "there is no vacant land." This statement is made from the standpoint that all the low land on which water can be easily conducted in ditches has been pre-empted or purchased, and all the bench land is suitable for grazing purposes only. From either of the above points of view, adopted in sincerity I am sure, the gross amount of agricultural land in the district would, comparatively speaking, be small.

Another conventionalism is "it rains more in Spallumcheen than it does in Priest Valley, the Mission and Penticton." For my part I can see no reason for any material difference in the rainfall at the points mentioned. The flanking mountains of the gold range bound these valleys on the east, and they appear to maintain the same elevation from Shuswap River to Penticton.

Dr. Dawson, page 7 B of his report, says: "The cause of the dry character of the climate is to be found in the wide and high coast ranges which intercept the moisture of the prevalent westerly winds. \* \* \* A second zone of precipitation, however, commences on the south-western slope of the Selkirk and Gold ranges." This accounts for the rainfall in this vicinity being in excess of that found in the more northern portions of the interior plateau.

No one appears to have kept any record of the rainfall in this district; in fact the nearest observation station is at Spence's Bridge. The rain clouds generally approach from the south, and it is reasonable to suppose, the rainfall of whatever quantity, would be pretty equally distributed. At any rate such was the case during my visit. The rainfall is evidently small from the timber growth, yellow pine (*P. Ponderosa*) predominating.

I gather from the resident farmers that during average seasons a few heavy showers fall during the spring of the year, and several during the summer before harvest time. I am told by every one that last year was the driest season ever known, some of the grain not receiving a single shower from the date of sowing to the time of harvesting, nevertheless in nearly every case fair crops were garnered. The average snowfall through all the valleys in question is about two feet.

In 1886, Mr. E. J. Tronson, in Priest Valley, raised 23 bushels of wheat to the acre. Mr. Price Ellison, on a bench 300 feet above Okanagan Lake, raised 31 bushels of wheat to the acre. At the head of Coldstream Valley, Mr. Vincent Duteau raised about 30 bushels of wheat to the acre, and at an elevation of 600 feet over Okanagan Lake. Near Swan Lake, Mr. Greenhow and Mr. T. Clinton raised 28 and 26 bushels of wheat to the acre, respectively. On the S.E.  $\frac{1}{4}$  of Section 21, and the S.W.  $\frac{1}{4}$  of Section 22, Township 7, Messrs. Lemieux & Hebert raised about 25 bushels to the acre of very superior wheat, at an elevation of 500 feet above Okanagan Lake. In Spallumcheen, Messrs. Lumby and Bennett raised 26 bushels of wheat to the acre. In none of the above cases was irrigation resorted to. From the above I conclude that all the bench land in the valleys under consideration are capable of yielding wheat without irrigation, and on that basis estimate the amount of agricultural land as follows:—

|                                                                                          | Acre.         |
|------------------------------------------------------------------------------------------|---------------|
| S. $\frac{1}{4}$ of Township No. 38 .....                                                | 5,760         |
| "      "      35 .....                                                                   | 17,280        |
| "      "      34 .....                                                                   | 14,720        |
| "      "      7 .....                                                                    | 15,360        |
| "      "      4 .....                                                                    | 5,120         |
| "      "      8 .....                                                                    | 11,520        |
| "      "      5 .....                                                                    | 3,200         |
| "      "      9 .....                                                                    | 11,520        |
| "      "      6 .....                                                                    | 7,680         |
| "      "      3 .....                                                                    | 11,520        |
|                                                                                          | <hr/> 103,680 |
| Townships 14, 20, 23 and 26 .....                                                        | 46,080        |
| Shuswap River, head of Mara Lake to north boundary of Section 15, Township 38, say ..... | 10,000        |
| Salmon River Valley .....                                                                | 12,000        |
| Mission Valley, south of Township 26 .....                                               | 15,000        |
| White Valley, and tributary valleys west of Township 3 .....                             | 15,000        |
| Deep Creek Valley .....                                                                  | 10,000        |
|                                                                                          | <hr/> 108,080 |
| Lands on Okanagan Lake .....                                                             | 20,000        |
| Cherry Creek (not visited), estimated by Mr. Corgill, C.E. ....                          | 16,000        |
|                                                                                          | <hr/> 36,000  |
| The area of land fit for agricultural purposes from Princeton to Keremeos .....          | 13,000        |
| From Keremeos to the Custom House .....                                                  | 15,000        |
| From Penticton to boundary line, 35 miles .....                                          | 30,000        |
|                                                                                          | <hr/> 58,000  |
| Total .....                                                                              | <hr/> 305,760 |

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The last three amounts were obtained from T. McK. Lambly, Esq., for several years Government Agent for the Osoyoos District.

I may here mention that a large valley is reported on a stream flowing into Shuswap River, about 3 miles east from Lambly's Landing. Another is reported between Mission Creek and Co.'s stream.

3rd. As to the accuracy of the verbal statements made by the promoters of the company to the Government of British Columbia, to the effect that the said lands are well adapted for wheat growing, and capable of producing wheat in sufficient quantities to supply the whole of the lower country, including Vancouver Island.

The history of wheat growing in this district is as follows:—At the Mission, the settlers have raised only such quantities of grain as they could dispose of in that neighbourhood. Mr. E. Lequime has a good mill, with one set of stones, run by a turbine water-wheel, with a capacity of probably ten barrels in twelve hours. He grinds for local consumption only. Mr. Lequime informed me that irrigation is necessary for the successful culture of wheat, his crops varying from 1,500 to 2,000 lbs. to the acre. Mr. A. B. Knox has a farm about two miles from Lequime's; does not irrigate his wheat; raises good crops; has a hundred acres of wheat this year, and says he could sow 900 acres if there was any market for it. He considers 2,000 lbs. to the acre is the average crop. At Priest Valley and Coldstream Valley, large crops of wheat would be grown if a market was obtainable. Mr. Ellison, at Priest Valley, has 110 acres of wheat in this year, and stated that he could put in 400 provided there was any sale for it. Mr. Duteau, at the head of the Coldstream Valley, has about 60 acres in wheat, but could sow 600. He grinds what wheat he has in a small mill, and sells the flour to miners on Cherry Creek, &c. The farmers in Spallumcheen Valley have been in a rather better position as regards a market, having been able to dispose of a considerable quantity of wheat yearly to the Shuswap Milling Co., at Kamloops; to Mr. T. Harper, at Bonaparte River, and the Tronquille Mills. The erection of a large flour-mill at Lambly's Landing, the head of navigation on Shuswap River, by Messrs. Lawes & Rashdall, has given quite an impetus to wheat growing for a distance of some 18 miles from it. Beyond that distance the farmers say it does not pay to haul the grain. I roughly estimate that there are now about 3,500 acres under wheat crop between the landing and the head of Okanagan Lake.

From what I could gather I should say one ton, or 33½ bushels, to the acre is the average yield for wheat throughout the district. This is a very large amount, but I am satisfied in favourable seasons it will be largely exceeded. Mr. G. R. Lawes, of the firm of Lawes & Rashdall, comes of an old milling family, in the neighbourhood of Salisbury, Wiltshire, England, where his father is still carrying on an extensive milling business. He has been in the flour making business all his life, and lately has managed a mill in Oregon. To him I am indebted for the following information:—The wheat grown in this district is a first class flour making article, and in his opinion is superior to Oregon grain. It is also far superior to the grain raised in Manitoba and the North-West Territories. The proportion of wheat to flour is as three to two, or it takes three tons of wheat to make two tons of flour. The mill erected by the Columbia Milling Company is calculated to turn out one hundred barrels of flour in a day of 24 hours. It can be run about 300 days in a year, manufacturing  $100 \times 300 = 30,000$  barrels, or 3,000 tons, of flour.

The quantity of wheat required to make that amount of flour will be  $3,000 \text{ tons} \times \frac{3}{2} = 4,500 \text{ tons}$ . Therefore assuming that my estimate of one ton to the acre is correct, it will take 4,500 acres of wheat to supply this mill with grain for one year.

The amount of flour imported into the Province of British Columbia was in—

|           |                |
|-----------|----------------|
| 1883..... | 40,701 barrels |
| 1884..... | 43,737 "       |
| 1885..... | 53,667 "       |
| 1886..... | 51,234 "       |
|           | <hr/>          |
|           | 189,339 "      |

Average for four years..... 47,334 "

Taking the average amount of flour annually imported from the United States into British Columbia at 50,000 barrels, it would require 7,500 acres of wheat land, yielding one ton to the acre, to grow that amount; or, in other words, it will take two mills with equal capacity to that of the Columbia Milling Company to grind sufficient flour to meet the demand in British

Columbia. With a railroad to Okanagan Lake, and a steamboat service, I am confident that ten times that amount of wheat can be raised without any material effort.

Messrs. Lawes & Rashdall expect to have their mill in running order by the first of August next. They inform me that they have 1,500 tons of last year's wheat on hand, which quantity is sufficient to supply the mill at its full capacity for four months. The cost of the mill on the day it starts work will be over \$60,000. I mention this fact to show Mr. Lawes' firm belief in the wheat-growing capacity of the district in the first place, and his confidence in being able to manufacture an article of flour which will compete successfully with that imported from Oregon, in the second.

If Messrs. Lawes & Rashdall succeed in stopping the drain on the resources of the Province for breadstuff, amounting annually to over \$200,000, they will deserve the thanks of the community at large.

There is, perhaps, one more subject to which I ought to refer, and that is the popular belief in the lower country that good wheat can be grown in Spallumcheen and Okanagan, but the crops at least one year in every two are frozen. I must confess that I had, before my visit to those localities, some vague idea in the same direction. I have taken the utmost care to sift this matter to the bottom. From the head of Mara Lake to Penticton, I have not met a man who ever heard of any injurious summer frosts.

The only attempt at any meteorological record in the district has been kept by Messrs. Lumby & Bennett. They have for a number of years recorded in their diaries the readings of a minimum thermometer and a few remarks as to the weather, &c., from which they have kindly permitted me to make the following extracts:—

1881.—Began seeding May 6th; finished sowing wheat 14th May; 22nd May thermometer 26°; very wet during June. In July it rained on the 29th, 30th, and 31st; commenced cutting grain August 6th; hailstorm on August 31st. In September it rained on the 6th, 7th, 8th, 9th, 10th, 11th, 12th, 15th, 17th, 18th, 19th, 20th, 23rd, 24th, 25th and 28th. October, 9 snowstorms; October 12th, thermometer 13°.

1882.—Finished seeding April 29th; plenty of rain in May; harvest finished September 10th; first frost October 31st.

1883.—Finished seeding May 15th, and cutting grain August 25th; first frost October 25th; thermometer 20°.

1884.—Finished seeding May 14th, and harvest September 8th; first frost October 3rd, thermometer 25°; second frost November 20th, thermometer 19°.

1885.—Finished seeding April 29th, and harvesting August 22nd; first frost November 11th, thermometer 20°.

1886.—Finished sowing May 3rd, and harvesting August 17th; first frost November 4th, thermometer 8°.

In this district the seeding is generally finished before the 20th May, and all the grain as a rule is garnered before the 1st September.

1881 was a very wet season, and Messrs. Lumby & Bennett lost about half their wheat, but all the other farmers in the neighbourhood managed to save their grain. Messrs. Lumby & Bennett account for their loss by being short of labour in the spring, thereby delaying the sowing of the wheat so that it had no opportunity of ripening. It was frozen in the milk on the 12th October.

I have, &c.,  
(Signed) A. S. FARWELL.